appreciative of the labor of others, and makes him conscious of the meaning of the responsibility of industrial service.

Abstracts for the following papers have not been received:

"A Laboratory Course in Chemical Engineering," W. H. Walker and Wm. K. Lewis.

"The Preparation of 'Known' Solutions in Qualitative Analysis," L. J. Curtman.

"Instruction in Physical Chemistry—Two Modifications," R. Stevenson.

"Suggestions as to Certain Desirable Changes in Chemical Nomenclature," Edwin Booth.

"Quantitative Analysis as a Science," W. D. Harkins.

DIVISION OF FERTILIZER CHEMISTRY

F. B. Carpenter, *chairman*

J. E. Breckenridge, *secretary*

The Determination of Nitrogen in Commercial Ammoniates of High Nitrogen Content. Report of the Committee on Nitrogen, Division of Fertilizer Chemists: Paul Rudnick, chairman.

Three samples were prepared, namely, dried blood, tankage and a complete fertilizer, all the nitrogen of which was derived from the same lot of dried blood. Forty-eight laboratories reported results by all the usual methods, including an average of 223 individual moisture determinations and 259 individual nitrogen determinations on each of the three samples.

The results were grouped into tables according to the methods employed. The results by the absolute or cupridoxid method were unsatisfactory and only one set of determinations by the soda lime method was received.

The individual variations from the arithmetical means in the several tables were large, but the average results of the "wet combustion" methods showed a very satisfactory agreement.

The Kjeldahl-Gunning method gave the highest results.

Special attention is called to the necessity for special precautions in the preparation and packing of samples representing shipments of these and similar commodities, in order that changes in the moisture content may be reduced to a minimum.

Abstracts for the following papers have not been received:

"The Results of Soil Investigations as Affecting the Use of Fertilizers," F. B. Carpenter.

"The Growth that Forms in Neutral Ammonium Citrate," Robert A. Hall.

"What Allowance should be made for Variation in Guarantee and Analysis of Fertilizer, and what, if any, Credit should be given a Manufacturer for an Excess in one or more of the Ingredients, to Offset a Deficiency in Another," R. E. Rose.

"Some Causes affecting the Accuracy of the Kjeldahl and Gunning Methods for the Determination of Nitrogen," Ray Henry.

"A Bacteriological Method for Determining Available Organic Nitrogen," J. M. McCandless.

"Uniform Rules and Regulations for the Admission of Ammoniates throughout the Southern States," J. M. McCandless.

"Availability of Organic Nitrogen," J. E. Breckenridge.

"The Use of Nitrate of Soda in Commercial Fertilizer," Charles S. Cathcart.

G. A. Farnham reported for the Committee on Phosphoric Acid.

J. E. Breckenridge reported for the Committee on Potash.

C. F. Hagedorn reported for the Committee on Phosphate Rock.

DIVISION OF PHARMACEUTICAL CHEMISTRY

A. B. Stevens, *chairman*

B. L. Murray, *secretary*

No abstracts were received from this division.

"Citro-compounds of Iron," A. B. Stevens.

"Pharmacopœial Standardization," A. B. Stevens.

"Does Oil of Sassafras contain Camphor?" Emerson R. Miller and G. H. Marsh.

"Assay of Gelsemium Root," L. E. Sayre.

B. E. Curry

Durham, N. H.

THE CHICAGO ACADEMY OF SCIENCES

The annual meeting of the Chicago Academy of Sciences was held January 10, 1911, at which time Dr. T. C. Chamberlin was reelected president; Mr. A. L. Stevenson, first vice-president; Dr. U. S. Grant, second vice-president, and Dr. Wallace W. Atwood was again made secretary. The reports of the officers of the academy showed that during the past year the work and the influence of the academy have become more strongly educational. The scientific collections and exhibits in the museum are carefully maintained and will always be available for specialists to study, but the museum is rapidly taking on a distinctly educational policy and the exhibits are being appropriately altered or replaced.

The loaning of museum material to the schools has continued; lecture courses or lessons have been offered to the children who have come as delegates from their respective school rooms; several illustrated lectures have been given at the schools; instructional courses open to the teachers of nature study have been offered and university credit courses have been conducted for those wishing to systematically pursue courses of instruction.

It is evident from the work, both of the museum and of the instructional courses given in cooperation with the work of the museum, that the academy is rapidly assuming a conspicuous place among the educational institutions of Chicago. The expressions of appreciation which have come to us from the superintendent and district superintendents of the public schools have been most encouraging. The expressions of appreciation which reach us from the principals and teachers more immediately engaged in the educational work of the North Side, are enthusiastic in praise and appreciation of the influence which the academy is having.

The opportunities for the academy lie far beyond anything which we have yet realized. The North Side of Chicago is distinctly lacking in any public institution which is actively assisting in the educational work of the schools and offering instructional courses for adults. The work of the academy should be consistently restricted to the utilization of the scientific data and material in educational work, but the opportunities within that field are among the most attractive that are open to any educational workers.

It is, indeed, somewhat surprising to see how easily the academy may become an effective instrument in the educational work of the city. There seem to have been so many gaps, so many places where we may fit in, and the regret is that we have not better facilities at the building and a larger force who may put their personal efforts into the promotion of science work among the young people and teachers of the city.

The institution has outgrown its present quarters and the demands upon it and the opportunities open to it indicate that the additional building which was originally planned for the institution should now be erected. We need a new building with an auditorium which has a seating capacity of five to eight hundred for various meetings and lectures. Class rooms, laboratories and children's work rooms in which courses of instruction may be conducted, should be provided and a children's museum should be placed in this additional space.

WALLACE W. ATWOOD,
Secretary

SOCIETIES AND ACADEMIES

THE PHILOSOPHICAL SOCIETY OF WASHINGTON

THE 688th meeting of the society was held on January 28, 1911, President Day in the chair. Three papers were read:

Integers Useful in Computing Square Roots of Numbers: Dr. R. S. WOODWARD, of Carnegie Institution of Washington.

This paper is a continuation and extension in application of the paper on "A Method of Precision for Computing Square Roots of Numbers," presented by the speaker at the 680th meeting of the society. This paper will later appear in full in the publications of the American Mathematical Society.

A Method for Grading the Results of Tests in Judging: Dr. LYMAN J. BRIGGS, of the Department of Agriculture.

This paper describes a rational method of grading student tests in judging such as are now extensively held in agricultural schools. These tests consist in determining how nearly five or more objects can be arranged in the correct order of excellence. Since adjacent objects, when the series is correctly arranged, differ in excellence in varying degree, it becomes necessary to take cognizance of this in grading the arrangements made by different students. Furthermore, since there are seven hundred and twenty possible arrangements of six objects, the grading of the different arrangements becomes hopelessly complicated unless some rational system is adopted.

The system proposed is based upon the three following principles:

1. Any arrangement of objects departing from the correct order is brought about through the exchange of adjacent objects.

2. The error due to transposing two adjacent objects from their correct order is directly proportional to the difference in excellence of the two objects transposed.

3. An erroneous arrangement is penalized in the exact proportion that the error bears to the greatest error that can be made in the series under consideration.

In employing this system of grading the instructor first decides upon the relative difference in excellence between adjacent objects in the